

The

# MARKETPLACE

For Recycling Commodities

Kentucky Recycling Assistance Section

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## The Evolving Battery Recycling Journey

*Carl Smith, CEO, Call2Recycle February 2018*

It's been 25 years since the first efforts to recycle consumer batteries began. During that time, a lot has changed and some things, unfortunately, have not. While there's no crystal ball for the future of batteries and recycling, a look at the last 25 years provides an appreciation of the work done and a glimpse into the future marketplace.

The first efforts to recycle consumer batteries occurred in the early 1990's. Prompted by the Resource Conservation and Recovery Act (RCRA), the government identified certain "metals of concern" when used and disposed, including three important materials used in batteries: mercury, lead and cadmium. Mercury was used in primary items while lead and cadmium were critical in rechargeable ones. In response to the requirements of RCRA, several states enacted legislation to ban the disposal of nickel cadmium (Ni-Cd) and small sealed lead acid (SSLA) batteries into landfills and placed certain requirements on manufacturers to take them back for recycling.

Certain voluntary and industry-backed battery recycling efforts – such as today's Call2Recycle program – forged their roots in keeping potentially harmful chemicals out of landfills.

In the early 1990's, very few devices could use rechargeable batteries. They simply could not deliver an acceptable level of performance to allow them to be widely used in laptops, telephones, power tools, cameras and other devices. So, the total number of devices using them did not demand widespread availability of battery recycling services – the need simply wasn't there. The batteries of that era were large, heavy and general available for frequent replacement. They had to be since the battery life wasn't very long. There were several retailers primarily devoted to selling replacement ones to support this use pattern.

By the mid-1990's, most US-based manufacturers of primary batteries had eliminated mercury from the batteries and the passage of the 1996 Mercury Containing and Rechargeable Battery Act affirmed this approach. Today, alkaline types are chemically benign and are usually sent to the landfill. Over the last five years, lithium ion (Li-Ion)

batteries have substantially replaced Ni-Cd and SSLA batteries in the market due to its higher energy density, lighter weight and flexible form factor. In 2016 alone, 5.6 billion lithium ion cells were sold, dwarfing the rechargeable battery sales of the entire 1990s. The proliferation in the battery market place is staggering and continues to grow by leaps and bounds.

While lithium ion batteries do not contain harmful chemicals, the safety risks in handling and transporting them have created a new set of environmental concerns. Consumer battery recycling no longer can be rationalized based on potentially harmful chemicals; the need to support battery recycling now must be based on the prospect of conserving resources and limiting the amount of virgin material used to manufacture them.

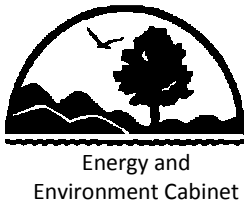
The rise in products with non-removable batteries is also impacting the battery recycling market. They've become ubiquitous, supporting the increasingly emerging internet of things (IoT), whereby everything is web-enabled and mobile. Almost no cellphones have easily removable batteries and battery power devices are in building walls, our clothes, and even in our bodies.

In looking to the future, the next 25 years will see equally significant changes. First, chemistries will continue to change. They will become more organically based instead of using metals. Second, they will be increasingly integrated into products, materials and the fabric of our lives. The concept of "wearable" technology is only now beginning to take hold. Think of a garment that cools or warms based on body temperature. Finally, batteries will become much more pervasive, powerful and smarter. They will power almost every mobile device. They will manage our homes and buildings in which we work.

Even with all these changes, a constant remains with the need to recycle. While recycling habits have slightly improved over the last 25 years, the amount of waste society generates has, if anything worsened. Batteries are just one of many materials where diversion must improve and continue to grow.

# COMMODITY

<u>PAPER-\$/TON</u>	<b>RecyclingMarkets.Net/Secondary Fiber Pricing (Midwest/Central Region) FOB</b>							
-	<b>Aug-17</b>	<b>Sep-17</b>	<b>Oct-17</b>	<b>Nov-17</b>	<b>Dec-17</b>	<b>Jan-18</b>	<b>Feb-18</b>	<b>Feb-17</b>
#2 mixed paper	\$65-75	\$60-65	\$30-35	\$30-35	\$30-35	\$30-35	\$20-25	\$75-80
#37 sorted office paper (SOP)	\$155-165	\$155-165	\$130-140	\$130-140	\$130-140	\$130-140	\$145-150	\$165-170
#8 ONP	\$90-100	\$70-80	\$50-60	\$50-60	\$50-60	\$50-60	\$50-60	\$85-90
#40 sorted white ledger (SWL)	\$205-215	\$205-215	\$205-215	\$205-215	\$205-215	\$215-225	\$225-235	\$205-215
#11 OCC	\$160-170	\$140-155	\$90-100	\$90-100	\$90-100	\$90-100	\$85-95	\$120-130
<u>PLASTICS-¢/LB.</u>	<b>RecyclingMarkets.Net/Secondary Materials Pricing - FOB</b>							
-	<b>Aug-17</b>	<b>Sep-17</b>	<b>Oct-17</b>	<b>Nov-17</b>	<b>Dec-17</b>	<b>Jan-18</b>	<b>Feb-18</b>	<b>Feb-17</b>
#1 PET - mixed (clear & green)	\$0.16	\$0.16	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.10
#2 HDPE (natural-milk jugs)	\$0.29	\$0.32	\$0.32	\$0.32	\$0.32	\$0.32	\$0.34	\$0.27
#2 HDPE (colored-detergent btls.)	\$0.14	\$0.17	\$0.19	\$0.19	\$0.17	\$0.16	\$0.16	\$0.17
<u>GLASS-\$/TON</u>	<b>RecyclingMarkets.Net/Secondary Materials Pricing - Delivered</b>							
-	<b>Aug-17</b>	<b>Sep-17</b>	<b>Oct-17</b>	<b>Nov-17</b>	<b>Dec-17</b>	<b>Jan-18</b>	<b>Feb-18</b>	<b>Feb-17</b>
clear (flint)	\$31.50	\$33.00	\$32.50	\$32.50	\$32.50	\$32.50	\$32.50	\$31.00
brown (amber)	\$27.50	\$22.50	\$27.50	\$27.50	\$27.50	\$22.50	\$22.50	\$27.50
green	\$12.50	\$12.50	\$12.50	\$12.50	\$12.50	\$12.50	\$12.50	\$12.50
<u>METALS</u>	<b>RecyclingMarkets.Net/Secondary Materials Pricing - Baled/Densified</b>							
-	<b>Aug-17</b>	<b>Sep-17</b>	<b>Oct-17</b>	<b>Nov-17</b>	<b>Dec-17</b>	<b>Jan-18</b>	<b>Feb-18</b>	<b>Feb-17</b>
aluminum beverage cans (UBC) cents/lb.	\$0.67	\$0.72	\$0.72	\$0.72	\$0.72	\$0.73	\$0.74	\$0.68
<b>RecyclingMarkets.Net/Secondary Materials Pricing - Baled</b>								
-	<b>Aug-17</b>	<b>Sep-17</b>	<b>Oct-17</b>	<b>Nov-17</b>	<b>Dec-17</b>	<b>Jan-18</b>	<b>Feb-18</b>	<b>Feb-17</b>
steel cans \$/TON	\$150-180	\$150-180	\$120-150	\$120-150	\$120-150	\$180-220	\$130-220	\$120-170



## Kentucky Recycling Assistance Section

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Division of Waste Management  
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